

Message Text

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SUBJ: NUCLEAR TEST BAN TECHNICAL TALKS

FOLLOWING IS THE TEXT OF THE STATEMENT MADE BY
DR. ROMNEY DURING THE PLENARY SESSION ON JUNE 13, 1974.

BEGIN TEXT...

I WOULD LIKE TO OUTLINE SOME OF THE MAIN ELEMENTS OF THE
TECHNICAL INFORMATION THAT SHOULD BE AVAILABLE TO FACILITATE
VERIFICATION OF A YIELD THRESHOLD.

FIRST, AS AMBASSADOR STOESSEL AND MR. IFFT HAVE MENTIONED,
WE SHOULD DEFINE AND DESCRIBE THE TEST SITE OR SITES TO BE USED.
THIS SHOULD INCLUDE THE GEOGRAPHICAL COORDINATES OF THE BOUNDARIES
OF EACH PROPOSED TEST SITE. IT SHOULD ALSO INCLUDE A GENERALIZED
DESCRIPTION OF THE SURFACE AND SUBSURFACE GEOLOGY IN SUFFICIENT
DETAIL TO PERMIT THE OTHER SIDE TO UNDERSTAND THE MAIN GEO-
PHYSICAL FEATURES THAT MIGHT AFFECT SEISMIC SIGNALS EMANATING
FROM THE TEST SITE.

SECOND, WE SHOULD DEFINE THE PRECISE BOUNDARIES OF THE
GEOPHYSICALLY DISTINCT ROCK UNITS OF THE TEST SITE WITHIN WHICH
FUTURE TESTS ARE PLANNED. BY GEOPHYSICALLY DISTINCT ROCK UNITS,
WE MEAN EITHER SINGLE, MASSIVE PETROLOGICAL UNITS OR BEDDED FORM-
ATIONS, WITHIN WHICH THE PHYSICAL CHARACTERISTICS WHICH AFFECT
SEISMIC COUPLING ARE APPROXIMATELY CONSTANT. IN OUR VIEW, IT
IS ESSENTIAL TO DEFINE THESE UNITS IN THREE DIMENSIONS; THAT IS,
BOTH SURFACE GEOLOGY AND PERTINENT CROSS-SECTIONS WOULD BE NECESSARY.
FOR EACH OF THESE GEOPHYSICALLY DISTINCT ROCK UNITS, INFORMATION

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SHOULD BE GIVEN ON THE ROCK TYPE, ITS DENSITY, SEISMIC VELOCITY,

POROSITY, PERCENT WATER SATURATION AND OTHER PHYSICAL PARAMETERS WHICH MIGHT PRODUCE SIGNIFICANT EFFECTS ON THE SEISMIC COUPLING.

GENERALLY SPEAKING, WE ARE NOT CONCERNED WITH LOCAL VARIATIONS OF THESE PHYSICAL PARAMETERS WHICH OCCUR OVER DISTANCES OF A FEW METERS. RATHER, WE BELIEVE THAT THE COUPLING DEPENDS UPON VALUES OF THESE PHYSICAL PARAMETERS AVERAGED OVER A DISTANCE OF ONE OR TWO TIMES THE RADIUS OF THE CAVITY CREATED BY THE EXPLOSION. THIS MIGHT MEAN 40 TO 80 METERS FOR EXPLOSIONS IN THE 10 KILOTON RANGE, 90 TO 180 METERS FOR EXPLOSIONS SLIGHTLY ABOVE 100KT, AND SO ON. PERHAPS OUR SOVIET COLLEAGUES HAVE EXPERIENCE WHICH BEARS ON THIS QUESTION. IF EXPLOSIONS ARE PLANNED NEAR THE BOUNDARIES OF GEOPHYSICALLY DISTINCT UNITS, THEN WE SHOULD DESCRIBE SIMILAR PHYSICAL CHARACTERISTICS OF ADJACENT UNITS OUT TO A DISTANCE SEVERAL TIMES LARGER THAN THE RADIUS OF THE CAVITY CREATED BY THE EXPLOSION.

IN ADDITION, THE US WILL REQUIRE DATA ON EXPLOSIONS SUITABLE FOR CALIBRATION OF THE COUPLING CHARACTERISTICS OF THE TESTING AREAS, AND FOR CALIBRATION OF THE TRAVEL TIME AND SEISMIC AMPLITUDES OVER THE ENTIRE PATH FROM THE SHOT POINT TO THE SPECIFIC SEISMIC STATIONS WHICH EACH SIDE WILL USE IN MONITORING. ADEQUATE DATA FROM EXPLOSIONS WILL BE NEEDED TO CALIBRATE EACH GEOPHYSICALLY DISTINCT ROCK UNIT IN WHICH TESTING IS PLANNED. THESE SHOULD BE FULLY TAMPED EXPLOSIONS FOR WHICH THE YIELD IS WELL KNOWN, AND THEY SHOULD REPRESENT AN APPROPRIATE RANGE OF YIELDS. INFORMATION WHICH IS REQUIRED INCLUDES THE PRECISE LOCATION, DEPTH, DATE, TIME, YIELD, AND THE GEOPHYSICAL UNIT IN WHICH THE EXPLOSION OCCURS. THESE CALIBRATION EXPLOSIONS SHOULD NOT HAVE OCCURRED MORE THAN SEVERAL YEARS AGO TO INSURE THAT THERE HAVE NOT BEEN TOO MANY CHANGES IN THE SEISMIC MONITORING STATIONS OR THEIR EQUIPMENT SINCE THE DATE OF THE EXPLOSION.

FROM THE FOREGOING IT IS EVIDENT THAT THE RELATIVE COMPLEXITY OF THE GEOLOGICAL SETTING AND THE THRESHOLD YIELD WILL DETERMINE THE DETAIL AND COMPLEXITY OF THE DATA TO BE PROVIDED. WE MAY CONCLUDE THAT THE SCALE THAT WOULD BE MOST USEFUL IN PRESENTING GEOLOGICAL AND PHYSICAL CHARACTERISTICS OF THE TEST SITE SHOULD BE SUFFICIENT TO DEFINE BOUNDARIES WHERE SIGNIFICANT CHANGES OCCUR WITHIN ABOUT ONE OR TWO CAVITY RADII FOR EXPLOSIONS AT THE THRESHOLD LEVEL.

END TEXT.

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